

REMARKS

The Applicants note that the Examiner objected to the claims presently on file under 35 USC 112 and 35 USC 103. The Applicants do not agree with the Examiner's position, and in view of the above amendments and the following arguments, asks that these objections be withdrawn.

On page 2, under the heading "Response to Amendment", the Examiner rejected the declaration under 37 CFR 1.132, alleged that the publication by Ray et al. is citable under 35 USC 102(b)/103.

The Applicants note that the Ray document did not publish any earlier than September 26, 1999. The priority date for the subject patent application is August 21, 2000 (by virtue of the claim to United States Patent Application Serial No. 60/226,754), which is less than twelve months after the publication date. Under 35 USC 102(b), the Applicants are granted twelve months grace, thus, the Ray document is not citable against the claims of the current application.

On page 2, the Examiner rejected claims 11 and 12 under 35 USC 112. The Applicants submit that both of these claims are clearly worded and that the courts have determined that such "memory medium" and "signal" claims are allowable under 35 USC. The landmark case is *In re Beauregard*, 53 F.3d 1583 (Fed. Cir. 1995), but of course a huge number of patents have now issued with such types of claims.

In the case of claims 11 and 12, the Applicants acknowledge that software protection is being sought for hardware devices, but submits that this is consistent with accepted practices. Integrated circuits and subsystems are designed on computers, and the machines which fabricate these integrated circuits are driven by software. When the Applicants design a filter, the specifics of the design are defined by software code. This software code is invariably stored on various computer memory media such as hard drives and CD roms, so it can be saved and accessed when required, or shipped in a physical form to a customer - hence the desire for claim 11. This software code is also commonly transported via electronic signals, for example, when emailing it to customers - hence the desire for claim 12.

The Applicants submit that the amended claims 11 and 12 are clear in that the proper transition has been made to protect the hardware development language (HDL) software code defining the physical structure of the inventive filter.

The Applicants therefore ask that this rejection under 35 USC 112 be withdrawn.

On pages 3 - 5 of the office action, the Examiner has rejected claims 1 - 12 under 35 USC 103(a), alleging that these claims are obvious having regard to Grundmann or Pawley, in view of Miya or Ray. The Applicants do not agree.

To begin with, as noted above, the Ray document is not properly citable against the claims. The Ray document published less than twelve months before the filing of the priority application, which is within the twelve month grace period allowed under 35 USC 102.

The Applicants also submit that the Pawley application cannot be applied against the claims. While the physical arrangement of the circuit in Figure 4 of the Pawley reference is similar to that of the claimed invention, it is being designed and applied for a different purpose. Hence, Pawley teaches design details such as component values, that are completely different from that of the invention. Specifically, the claimed invention deals with filters, while Pawley is clearly dealing with phase shifting networks:

1. the title reads: "Phase Shifting Network"
2. column 1, lines 1 - 2 read: "This device relates to electrical voltage phase shifting networks"; and
3. column 2, lines 42 - 45 read: "It is therefore one object of this invention to provide an electrical network operative to vary voltage phase over a wide range with constant attenuation."

The Examiner made reference to the circuit of Figure 4 in the Pawley patent, and in particular, alleged that resistor 16 was selected to be equal to the impedance of the inductor and capacitors at their resonant frequency. The Applicants do not agree.

Reference is made to resistor 16 in three locations of the Pawley patent, and no place is reference made to selection of a resistor "to be equal to the impedance of the inductor and capacitors at their resonant frequency". In each case, however, the resistor 16 is selected to vary the phase shift of the circuit:

4. at column 6, lines 17 - 18, which reads: "permitting variation of phase shift by means of a control resistance 16 ...";
5. at column 6, lines 33 - 36, which reads: "the given electrical characteristics attributable to the network permitting wide range of phase shift with constant attenuation as resistive component 16 is varied ..."; and
6. at column 8, lines 7 - 9 read: "... enables this network to shift time phase by varying the impedance value C of network arm 16."

Thus, Pawley does not describe a filter at all, but a phase shifter, which is unrelated to the claims of the present patent application.

This leaves the Examiner's rejection of the integrated microwave filter claims relying on the 66 year old Grundmann reference, in combination with the Miya reference which presents integrated but inferior filter designs (the designs presented by Miya are along the lines of those described in the Background of Applicants' patent application).

It is difficult to see how it could be considered obvious to use the circuit design of the Grundmann reference, which appears to have been neglected or discarded over the last 66 years. The age of the reference and lack of use in other applications would seem to make its utility questionable in any application, let alone in the remote application of the invention (integrated microwave filters). Given the obscurity, the fact that it was neglected, and the questionable utility, it is difficult to see how a person having ordinary skill in the art would be motivated to locate it and apply it to the problems of the invention.

More specifically, as previously noted, the Grundmann patent clearly deals with discrete components in an era of vacuum tube technology. Thus, it does not discuss any of the following areas of the invention:

7. integrated circuits and/or techniques;
8. designing integrated inductors in combination with capacitors;
9. placing integrated components on an underlying resistive substrate (opposed to a dielectric as done in discrete design);
10. implementation of variable capacitors;
11. using low-Q integrated (i.e. 7-10) elements (in discrete designs Q's are in the order of 20-40); or
12. circuits which are operable in the GHz range.

The Applicants submit that this reference is so remote from the invention that it cannot be considered relevant in an obviousness argument.

Also, as previously noted, United States Patent No. 5,697,087 issuing to Miya et al., describes a device that is quite different from that of the invention. For example, Miya et al.:

13. do not describe the circuit as defined in any of the claims. The Miya filters, for example, do not use resistors, and do not describe layouts of capacitors, inductors and resistors, which are similar to the layouts of the invention;

14. generally describe band pass filters, while the invention is focussed more on notching filters; and
15. do not describe circuitry to increase the Q of the filter — Q is determined by the Q of the components, and can only be increased by increasing the number of tank elements (per Figure 8).

The Applicants note that the two tests for obviousness as outlined in section 706.02 (j) of the Manual of Patent Examination Procedure (MPEP) read as follows:

"First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)." (emphasis added);
and

"The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." Ex parte Clapp, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985)." (emphasis added)

The Applicants do not believe that either test has been satisfied. For example, the Applicants note that:

16. there is no suggestion or motivation for one of ordinary skill in the art, to seek out the long-ignored Grundmann patent in an effort to address the problems of the invention.

The Examiner notes that integrated circuit technology is often used to reduce the size of circuits, but far more is being done in this case. There is no "suggestion" that the Grundmann circuit:

1. will operate effectively in terms of performance at the claimed microwave frequencies (as opposed to radio frequencies). The performance of filters is non-linear, so there is nothing obvious about how a filter used in one application, will perform in another;
 2. could physically be reduced to fit on an integrated circuit at the claimed microwave frequencies (i.e. if any of the capacitors, inductors or resistors had to be very large, the circuit could not be integrated); and
 3. there is no teaching in the Grundmann patent about how components and values could be selected for the integrated microwave application.
17. as previously noted, there is no suggestion or motivation to research vacuum tubes and discrete technology, as the current teaching in the art of RF technology is moving in a different direction. As explained in paragraphs [0010] - [0012] and at the end of paragraph [0012], SAW filters are generally used in the art rather than passive or active LC filters. Because of this, one would not expect a skilled technician to go against the current teachings in the art (toward SAW filters) and attempt to improve on discrete LC filters;
18. there is enough difficulty modifying recent developed integrated RF designs to behave as desired, let alone attempting to transfer the 66 year old technology of the Grundmann patent into an integrated RF environment. There would simply be no reasonable expectation of success as required by the test in the MPEP; and
19. neither of the three cited references recite an integrated resistor, thus, the requirement that the prior art references must teach or suggest all the claim limitations, has not been met.

Most important, the components of the claimed invention offer a synergy that is not expressly or impliedly suggested by the cited references. Because of this synergy, it could not be held that the necessary convincing line of reasoning exists, to combine the references as suggested by the Examiner.

Specifically, the circuit as described in each of claims 1 - 12 has the property that it offers a high-Q circuit using low-Q integrated components. This property is described in paragraphs [0036]

and [0037]. Neither of the cited references lead the reader to a circuit which has this property. Miya et al. teach a low-Q filter using low-Q components, and while the Grundmann patent describes a similar arrangement of components, it does not discuss integration at all. Thus, neither of these references teaches a high-Q circuit using low-Q integrated components.

The Examiner rejected this argument on the grounds that the high-Q and low-Q limitations were not explicitly recited in the claims. The Applicants do not agree that this argument can be rejected in this manner.

The whole purpose of the invention is to provide a high-Q filter. This is emphasized many times in the disclosure, and would certainly be appreciated by one skilled in the art. Also, as noted in paragraph 16, it is an inherent property of standard integrated inductors and capacitors at the claimed microwave frequencies, that they will have low-Q.

The terms "low-Q" and "high-Q" are not precisely defined in the art, and the Applicants are reluctant to offer definitions where the industry has not. Nonetheless, the general sense of these terms would be clear to one skilled in the art. It would also be clear to one skilled in the art that this is the purpose of the invention, and is inherent in the claims.

Thus, the Applicants submit that the Examiner has not satisfied the requirements of the obviousness test, and asks that the Examiner withdraw this objection under 35 USC 103.

If the Examiner wishes to continue to debate the allowability of the claims, it would seem logical to define the "person having ordinary skill in the art" as required under 35 USC 103(a). Such a person has not been defined by the Examiner. This is problematic because of the complexity of the subject matter and diversity of the prior art been cited. For example, is the "person having ordinary skill in the art":

- an RF design engineer?
- a microwave design engineer?
- a wireless design engineer?
- a communications engineer?
- an electronic designer with expertise in vacuum tube technology and designs?
- an electronic designer with expertise in discrete LC design?
- a filter designer?
- an integrated circuit designer? or
- an microwave integrated circuit designer?

In view of the above amendments and remarks and having dealt with all the objections raised by the Examiner, reconsideration and allowance of the subject patent application is courteously requested.

Respectfully submitted,

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G&C 119.7-US-U1

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JUL 09 2003
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